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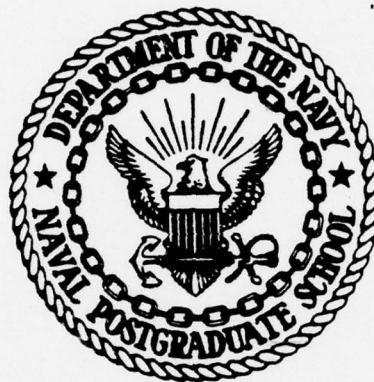
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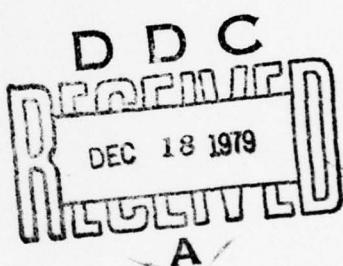
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CONSTRUCTION AND DEFENSE CONTRACTING

by

10 Glenn James Pittman

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Thesis Advisor:

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The Cost of Money on Assets Under Construction  
and Defense Contracting

by

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Submitted in partial fulfillment of the  
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#### ABSTRACT

On May 5, 1978, the Cost Accounting Standards Board issued a proposal containing two possible alternatives for the allocation of the cost of money associated with assets under construction. Alternative A would require capitalization while Alternative B would modify a current standard to include the interest on construction. This thesis examines the nature of the commitment by a sample of government contractors to construction-in-process and the interest cost associated with this level of investment. It then examines and evaluates the cost streams associated with each of the alternatives and a hypothetical asset under construction account. It was determined that by using present value, and at reasonable discount rates, the differences between the two alternatives could be considered immaterial.

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## I. INTRODUCTION

### A. PURPOSE

On May 5, 1978, the Cost Accounting Standards Board (CASB) issued a staff draft proposal to deal with allocation of the cost of money associated with investment in assets under construction. Included in the staff draft were two proposals for treatment of this cost. One alternative would require the issuance of a new cost accounting standard (CAS) to deal with the cost of money allocated to construction in progress. The second alternative proposed amending the current cost accounting standard, CAS 414, dealing with the cost of money associated with assets already in use, to include treatment of assets under construction.

The primary research objective here is to evaluate the two CASB proposals in view of current policies to determine the possible effects from their implementation on government contract costs. A related question involves looking at the nature and formulation of the concept of interest and its use in contracting.

### B. LIMITATIONS

In order to fulfill the primary research objective both a hypothetical construction account and actual financial data of defense contractors are utilized. The hypothetical construction account is utilized in an example to illustrate the cost streams associated with each alternative.

Financial data on construction in progress in defense contractors are essential to the evaluation of the effects of the proposals. In order to obtain this information annual corporate financial reports (10K's) submitted to the Securities and Exchange Commission were obtained for a

sample of defense contractors. These data were analyzed and the results used in the analysis of the proposals. Data were not available for individual contractors who operate as wholly owned subsidiaries of larger corporations. In these cases the data for the parent corporation were used. Financial data were sought from an original sample of 30 defense contractors which had defense contracts equal to or exceeding \$10 million in 1978. Due to time constraints, only 25 sets of data were received in time for evaluation and of these only 18 contained the information needed for this study.

It is assumed that the reader has a basic understanding of accounting and the areas of cost accounting and defense contracting in particular.

#### C. ORGANIZATION OF STUDY

In Section II, the concept of interest in economics and accounting will be examined. Some of the fundamental similarities as well as differences between the two areas will be discussed. Interest and its historical treatment in defense contracting will also be surveyed.

The next section will present the details of the two alternative proposals for allocation of the cost of money on assets under construction. This will be followed in Section IV by a summary of comments received by the CASB staff in response to their staff draft proposals.

Section V will present an analysis of the two alternatives. It begins with the review and analysis of related financial data from a sample of defense contractors. This is followed by the presentation of the alternatives' effects on the hypothetical asset-under-construction account.

Lastly, there is a summary of the data presented in the analysis section and a recommendation for further research.

## II. BACKGROUND

### A. THE CONCEPT OF INTEREST IN ECONOMICS

The nature and causal relationships inherent in the concept of interest have been debated in economics for over two hundred years. This debate has centered on whether a "monetary" or "nonmonetary" theory best describes the nature and behavior of interest and interest rates.

#### 1. Monetary Theories of Interest

Monetary theories of interest are by far the most prominent in economic theory. By "monetary" it is meant to include any of a group of analyses that introduce the element of money supply and demand at the outset of the argument and generally deny that the features of economic life can be represented through the use of a barter model [5;p.23].

The "quantity theory of money" presented by writers of the early 18th Century is a good example of a "monetary" theory of interest behavior. Here the value of money was defined as the amount one could expect to receive when lending it (the interest rate) or when buying commodities (the price level). Both of these factors (interest rate and purchasing power) were seen to be inversely proportional to the money supply. That is, interest rates and purchasing power would decrease as the money supply increased and more and more money became available for lending or buying. Also, both interest rates and purchasing power would tend to increase as the supply of money decreased because less money would be available for either lending or purchasing of commodities [6;p.15]. Later refinements to the basic quantity theory of money, such as those by Cantillon, tended to separate the effects of money supply on interest rates and price level changes. On the basis of experience in the money market of 1720 London,

Cantillon stated that "The Interest of (sic) Money in a State is settled by the proportionate number of Lenders and Borrowers." [20;p.127]. Therefore this relationship and not the money supply as a whole was viewed as the driver of interest rates.

## 2. Nonmonetary Theories of Interest

While the monetary theories tie interest to the overall money supply, the classical or nonmonetary theories tend to use the money supply only as an intermediate step in a large "barter" type system. These non-monetary theories are also characterized by the fact that their control models contain no specific variables which take into account the quantity or rates of use for money. These writings are almost exclusively described as theories of "profits", with interest considered as a part of or type of profit.

One of the classical examples of a nonmonetary theory of interest is a theory proposed by Nassau Senior called the "abstinence theory of interest." Moffat in the Economics Dictionary explains the abstinence theory:

If the cost of borrowed money (interest) was zero, the demand for money would far exceed supply because most people would rather have their goods now. Therefore, for some to be able to borrow money, others must make money available through abstinence from current spending - the interest they earn is compensation for this abstinence [14;p.3].

A second example of nonmonetary theories of interest is the set of theories based on part of the theory of distribution. In this example, the economy is divided into four productive groups, labor, landlords, owners of capital, and entrepreneurs, each with its own type of income. These are wages, rent, interest, and profit, respectively. In the distribution theory, interest is the income paid to an owner of capital for

use of this capital. Essentially, this interest payment is an inducement to persons or organizations to part with money temporarily to allow other persons, firms, or organizations to make use of it [3,6].

Ammer, in her Dictionary of Business and Economics defines interest as "... the returns earned by capital, one of the factors of production" [2;p.3]. In both the monetary theories and the classical theories, interest is viewed as a "cost" associated with the use of money or other resources. The use of money capital requires the payment of certain costs. In economic theory there is no distinction between contractual interest payable to lenders on debt instruments and interest payable to internal sources such as owners' investment, depreciation charges or undistributed profits [3;p.11]. These interest elements are viewed as necessary costs of doing business and should be recognized as such.

#### B. THE CONCEPT OF INTEREST IN ACCOUNTING

Accounting is the function of measuring, recording, and reporting the economic workings of the business unit for both external parties, such as the stockholders or the Securities and Exchange Commission, and for internal users to aid in the management decision making process. While the reality of interest is recognized in both areas of accounting practice, its treatment in each is often very different.

##### 1. Interest in Financial Accounting

Financial accounting is concerned with the measurement and reporting of accounting information primarily to parties external to the business entity. These interested parties include the business entity's owners or stockholders, investors or potential investors, governmental agencies such as the Internal Revenue Service and Securities and Exchange Commission, creditors, and the general public at large [23;p.1]. The

accounting information provided is available to aid in the decision-making process and to enable both these external parties and the business entity to measure the results after the business entity's past decisions have been made and implemented.

In the context of financial accounting, interest is incurred because of the time value of money associated with liabilities. Since interest expense is a "rental fee" paid to a lender (creditor) for the use of his funds, for some period of time, it has traditionally been viewed by financial accountants as an expense of the period in which incurred.<sup>1</sup> It is important to note that financial accounting does not recognize costs incurred through the use of equity capital as an interest cost. This is in accordance with current generally accepted accounting principles, which do not support the recording of interest on equity capital as an expense of obtaining capital for the business entity. Although Robert N. Anthony, in his book Accounting for the Cost of Interest, states that both the "entity concept" and the "cost concept" support the recording of equity interest as a business expense, this practice is not sanctioned at present [3;pp.12-20].

## 2. Interest in Managerial Accounting

While financial accounting is geared for external reporting functions, managerial accounting is concerned primarily with the presentation of financial information for use in internal decision-making processes. As such, managerial accounting must be able to supply

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1. An "expense of the period" or, as most often referred to, a "period expense" is a concept which might need further explanation. In general, it is any expenditure that is assigned to expense on a time basis rather than on a basis of service yield or similar circumstance. Most often this distinction is academic as the two bases coincide.

information about specific individual segments of a business entity's operations. This should enable management to make intelligent decisions regarding the day to day operation as well as the long range operation of the business entity. Due to the scope and nature of managerial accounting information, the use of interest is based more on its relevance to individual decisions than on general principles. Unlike financial accounting, interest on both debt and equity capital are considered [10].

In managerial accounting the interest cost associated with equity capital is termed an "imputed cost." An imputed cost is a cost that results from business operations and therefore a relevant cost to the business entity but does not result in an actual cash outlay. This view does not differ materially from the economists' definition of opportunity costs. For example, if a contractor's investment in his business is earning a rate of return less than the rate of return available from an equal investment in some other area, such as high yield municipal bonds, then this contractor is incurring an opportunity cost equal to the difference between what his return would be by investing in the municipal bonds and his current return on his business investment. He is incurring this cost even if it is not and never will be stated in his books [21].

In capital budgeting, interest on both debt and equity plays a significant role in the determination of the nature and types of capital expenditures undertaken through its role in the determination of a cost of capital, either specific or average, which is often used as a "hurdle rate" for capital outlays. Investments which promise a rate of return greater than the average cost of capital are considered acceptable, while those which fail to meet the "hurdle rate" are postponed or discarded. This procedure provides a minimum profitability criterion for capital

expenditures that meets or exceeds the weighted average of all available sources of the company's funds. It is again important to note that the cost or interest associated with obtaining funds through equity sources is considered as well as the interest expenditures associated with obtaining funds through debt instruments.

#### C. HISTORICAL TREATMENT OF INTEREST AS A COST

##### 1. Cost or Profit?

Interest was first recognized as a cost in the United States with the advent of the public utility commissions in 1870. In early court cases, the courts made a definite distinction between interest as a cost and the profit of the companies. No distinction was made between interest associated with debt or equity capital [3;p.21].

In an article in the October 1916 Journal of Accountancy, W. P. Hilton, the director of the Harvard Research Bureau, clarified the position that no business enterprise could be profitable until all opportunity and interest costs were met.

The Bureau has come to the conclusion that every business, whether or not incorporated, should bear a specific charge for interest on the net investment - the amount which capital could earn if invested elsewhere. No business is truly profitable unless it yields the proprietor not only a salary for his time, and rent for his store, if he owns it, but also interest on this investment [11;p.42].

The inclusion of interest as a cost of production was not widely considered acceptable. In its 1918 yearbook, the American Institute of Accountants, predecessor of the current American Institute of Certified Public Accountants (AICPA) stated that:

The inclusion in production cost of interest on investment is unsound in theory and wrong, not to say absurd, in practice [19;p.110].

## 2. Interest as a Capitalized Cost

The academic discussion of whether interest was a recognizable cost continued with little attention to the practical importance of its application. Not until 1973 did the AICPA, in its pronouncement on accounting for retail land sales, indicate its acceptance of the capitalization of interest on land inventory [3;p.24]. Other agencies, however, have allowed the treatment of interest as a cost to be capitalized. The Federal Power Commission and the Federal Communications Commission are two examples of regulatory agencies which have allowed the capitalization of interest on both debt and equity capital.

It is important to note that the Financial Accounting Standards Board (FASB) has currently under consideration a proposal which would require the capitalization of interest costs as part of the historical cost of an asset which required a significant time period before it was ready for its intended use. This will be discussed further in a later section.

The motivation for capitalizing interest costs and other carrying costs associated with long-range construction or land held for future use is apparent for public utilities whose rates are regulated and calculated on their asset base. The positive effects on financial statements by raising asset values and at the same time raising reported net income and earnings per share provides motivation for other companies and corporations as well to capitalize interest costs where possible. Due to the lack of consensus, even within industry segments, on the treatment of interest costs, the Securities and Exchange Commission in its 1974 Accounting Series Release No. 163 prohibited the capitalization of interest (with exceptions) unless the company had previously been capitalizing interest on assets of this general kind.

Accordingly, the Commission concludes that companies other than electric, gas, water and those companies covered by the two exceptions in authoritative described literature above (AICPA Guides for Savings and Loan Associations and Retail Land Sales) which had not, as of June 21, 1974, publicly disclosed an accounting policy of capitalizing interest costs shall not follow such a policy in financial statements... after June 21, 1974 [1;p.2].

### 3. Interest and Defense Contracts

For defense contract accounting, interest was historically an unallowable cost but was considered by the government when establishing the profit under cost-reimbursement type contracts. On fixed priced contracts, the government's position had not always been clear. Some contracting officers had disallowed interest while others had allowed it as a cost. Still others treated it separately or in conjunction with other types of considerations when determining profit margins. With the advent of the Armed Services Procurement Regulations, all interest and related financial costs were specifically cited as being unallowable, with the exception of interest that was incurred by a contractor because of nonpayment of taxes resulting directly from actions of the contracting officer [22;pp.126-127].

The Department of Defense's success in using profit as a motivation for contract performance had often been criticized. A profit measure based solely on estimated costs was viewed as giving little reason for a contractor to invest capital in cost-reducing equipment. A 1967 Logistics Management School report stated:

... the present Guidelines applied on individual contract negotiations tend to establish a lower dollar profit objective for an efficient plant with a large investment in facilities than it would for a less efficient plant producing the same output [12;p.93].

In 1971, a General Accounting Office (GAO) report also advised a profit policy based on a capital investment formula [12;p.94].

Following a study in 1976 of defense contractor profit margins and investment return, titled "Profit '76" [17], DoD instituted a new profit policy which had the objective, among others, to stimulate defense contractor's capital investment in modern facilities resulting in more economical performance. Mr. Frank Shrouty, Assistant Secretary of Defense (Installations and Logistics) stated:

Over the last several years, the level of contractor facility investment in Department of Defense Contracts has been considerably lower than in comparable commercial endeavors, ... The reasons for contractor reluctance to invest in modern machinery and equipment for use on DoD contracts are many and varied, but it is clear that some are rooted in present procurement policy which fails to recognize adequately (either in profit or as an allowable cost) the facility investment which may be required for efficient operation... [4;p.i].

Due to the Profit'76 study, several significant changes were made to DoD contract pricing policy. An imputed cost of capital (interest) for facility investment as defined by newly instituted Cost Accounting Standard (CAS) 414, Cost of Money as an Element of Cost of Facilities Capital, was considered an allowable cost on negotiated defense contracts. Contractors' investment in facilities and equipment was to be recognized in the negotiation and setting of a profit objective associated with contract performance.

#### D. SUMMARY

In economics, interest is based on either a monetary theory, or non-monetary theory. In both instances, interest is a fee, similar to rent, paid to an owner of capital for use of his funds by the entrepreneur.

Accounting has traditionally treated interest as an expense of the period in which incurred and has limited it to the cost associated with debt capital only. The cost of equity capital has not been considered as an interest expense. Exceptions to these two rules exist primarily in the regulated utilities, where considerations of long term construction projects and asset based return on investment rate structures have promoted the capitalization of interest expenses on both debt and equity on construction-in-progress and land purchased for future use.

In Federal government contracting and DoD in particular, interest was traditionally an unallowable contract cost. However, with the increase of data supporting theories that the profit policy in use was in fact a negative motivation factor for contractor investment and as a result of the Profit'76 study, DoD modified its policies to include interest on facilities capital as an allowable cost. It was to be computed under the guidelines of CAS 414.

The current proposal under consideration by the Cost Accounting Standards Board, would extend the allocation of the 'Cost of Money' concept to include contractor investment in facilities capital items still under construction. The alternative methods for accomplishing this will be discussed in the next section.

### III. THE APPROACHES FOR RECOGNIZING THE COST OF MONEY ON ASSETS UNDER CONSTRUCTION

In a letter dated May 5, 1978, the Cost Accounting Standards Board presented a staff research proposal considering the extension of the concepts of "facilities capital"<sup>2</sup> and "cost of money" to allow recognition of contractors' investments in construction-in-progress (See Appendix A). In order for this to be accomplished, two mutually exclusive alternative proposals were presented. One, Alternative A, would require the capitalization of the cost of money on such investments as part of the acquisition cost. The second choice, Alternative B, involves the modification and extension of the current Cost Accounting Standard 414, Cost of Money as an Element of Facilities Capital, to include interest on assets under construction. While Alternative A would allocate these "costs" to future contracts when the asset was actually in use. Alternative B would result in the allocation of these costs to contracts of the current period. Each alternative will be presented in detail.

#### A. CAPITALIZATION OF IMPUTED INTEREST COSTS

##### 1. Financial Accounting Standards Board (FASB) Guidelines and Proposal

On September 18, 1974, the FASB Advisory Council recommended that the subject of accounting for interest costs should be considered and added

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<sup>2</sup> Facilities capital is defined in CAS 414 as the net book value of tangible capital assets and those intangible capital assets that are subject to amortization. Intangible capital assets are those assets with no physical substance, have more than minimal value, and are expected to be held by the entity for use or possession beyond the current accounting period.

to the agenda of the FASB. The subject was added to the Board's technical agenda and a task force of sixteen members from industry, academe, the financial community, and the public accounting profession were assembled as counsel to the Board in preparing a Discussion Memorandum on the subject of accounting for interest costs. The question of capitalization of interest costs had never been fully resolved by any pronouncement of a standard setting body.

Prior to publication of its Discussion Memorandum, the FASB staff made three surveys to ascertain what was the current practice in accounting for interest. The surveys revealed the following facts: (1) Except in the public utility and real estate development industries, interest is capitalized by only a small number of companies. (2) The percentage of companies disclosing the practice of capitalizing interest has grown in recent years. (3) There is a broad range of industries in which companies capitalize interest. (4) Construction-in-progress is the asset most frequently associated with capitalization of interest. (5) There is no general consensus among proponents as to how the amount of interest to be capitalized is determined or reported in financial statements. (6) There is no consensus on the method or criteria used to establish the length of the capitalization period [9;p.99].

TABLE 1  
Companies Capitalizing Interest

<u>Year</u>	<u>Number of Companies</u>	<u>% Companies Surveyed</u>
1967-69	8	1.3%
1970	21	3.5
1971	25	4.2
1972	40	6.7
1973	34	5.7
1974	41	6.8
1975	47	7.8

Source: FASB Discussion Memorandum on Accounting for Interest Costs

Table 1, developed by the FASB staff, indicates the growing percentage of companies that are employing capitalization of interest costs in their accounting systems. The data were based on a sample of 600 industrial or commercial companies [9;p.100].

The FASB Discussion Memorandum was published on December 16, 1977. It sought comments on the applicability, clarity, consequences, implementation issues and costs associated with the three alternatives proposed. These alternatives were as follows: First, account for interest on debt as a period expense. Second, capitalize interest on debt as a part of the cost of an asset when certain prescribed conditions are met. Third, capitalize interest on debt and imputed interest on equity as part of the cost of an asset when certain prescribed conditions are met. If alternatives other than those above were desired, comments relative to these were also solicited [9;p.11].

On December 15, 1978, the FASB published an exposure draft of a proposed standard on capitalization of interest costs. Given the Board's opinion that any new standard be based on methods or concepts applied in current accounting models based on historical costs, the Board chose to adopt the alternative of capitalizing interest on debt only as part of the cost of an asset. The Board stated that interest is considered a part of the cost of acquiring an asset when two conditions are met:

- a. The nature of the asset is such that a period of time is required to bring it to the condition and location necessary for its intended use.
- b. The period of time is significant [18;p.33].

The amount of interest cost that could be allocated to the asset is based on the amount of interest applicable either to a specific new borrowing associated with the asset or to an historical progression of borrowing

until the average accumulated expenditures on the asset are matched with these other less recent borrowings. In no case shall the amount of interest allocated exceed the interest cost incurred by the enterprise during that period. Interest would be capitalized from the time of the first expenditure to the time that active development of the asset stops [18;pp.4-6].

2. Cost Accounting Standards Board Proposed Standard - Alternative A

Alternative A of the CASB staff draft on Cost of Money as an Element of the Cost of Facilities Capital Under Construction or Development (Appendix B) is to provide for greater recognition of contractors' investment by allocation and capitalization of a cost of money to contractors' assets under construction. The cost of money (interest) rate applicable under this proposed standard would be identical to that used currently under CAS 414, the rate published by the Secretary of the Treasury under Public Law 92-41. This rate is published by the Secretary semiannually and takes into account current private and commercial rates of interest for new loans with a maturity date of approximately five years. In its comments regarding the selection of this rate for application under CAS 414, the Board recognized that this specific rate will rarely be equal to the precise borrowing rate incurred by an individual contractor but will tend toward the average expected to be experienced by all contractors [8;p.5651-2].

In applying the standard, the applicable cost of money to be included in the asset's value will be determined only once for each accounting period. A representative investment value must be determined for each facilities capital item. This will normally be the arithmetic mean of recorded end-of-month balances for the asset during its period

of construction. If a company normally uses some period other than a month in its cost accounting system, these balances will be appropriate for use instead of end-of-month balances as stated before. If no material difference would exist, the representative value of the asset may also be determined by using beginning and ending balances for the entire cost accounting period and this value substituted for the computation based on end-of-month balances[13].

The cost of money rate to be applied to the representative asset value may be determined by one of two methods. For any period or fraction of a period, the arithmetic mean of the interest rates under Public Law 92-41 that were applicable for that period is applied. Where the period is less than one year, the appropriate fraction of the annual rate should be applied. The second alternative would be for a contractor to apply the appropriate fractional cost of money rate to each month-end balance. The standard also would provide that any cost of money allocated to a construction project can be capitalized as part of the cost of the asset only at the beginning of the next cost accounting period. Therefore, the month-end balance for the first of a new period would contain not only the additional expenditures of that month but also any cost of money allocated to the project under the standard for the previous period [13].

An illustration of the technique applied in this alternative is provided as part of the standard in paragraph "4\_.60 Illustration" of Appendix B.

#### B. IMPUTED INTEREST AS A COST OF THE PERIOD

The treatment of imputed interest on assets under construction as a period expense involves amending the current Cost Accounting Standard

Number 414, Cost of Money as an Element of the Cost of Facilities Capital, to include consideration of expenditures on assets under construction.

1. CAS 414

In order for contractors to perform on negotiated defense contracts, they usually require substantial investments in facilities. Accounting principles applicable to financial reporting and income tax reporting did not provide an explicit procedure which would allow identification of the contractors' cost of capital associated with funds committed to these facilities.

Comments to the Board regarding the proposal to recognize a part of contractors' cost of capital as a contract cost tended to be divided. Respondents who represented defense contractors and academe tended to favor the plan. Other commentators, and Government agencies specifically, were not in favor of the proposal and believed that interest on contractors' investments should be considered in the determination of profit compensation rather than treated as an element of contract cost.

[8;p.5651]. In response the Board concluded that:

The cost to be measured, even though imputed, is real and is relevant for contract costing. The Board is persuaded that there has not been adequate agreement on techniques for measuring it. A Cost Accounting Standard is, therefore, appropriate [8;p.5651].

CAS 414 is based on an allocation to negotiated defense contracts of an appropriate share of the total cost of money which can be identified with facilities capital employed in a business unit. Under CAS 414, the contractors' facilities capital investment is measured and allocated; then a cost of money rate is applied in order to obtain a cost of money applicable to each contract.

In order to determine the cost of money applicable to defense contracts, the contractor must first determine the asset base of his investment. This is determined as the average net book value of his assets that were outstanding during the period. This will include not only tangible assets which are subject to depreciation but also land, leaseholds, an allocable share of corporate-owned and leased facilities, and intangible capital assets that are subject to amortization. The average net book value is computed by obtaining the average of the beginning and ending balances appropriate to the specific accounting period.

All facilities capital items that are uniquely applicable to one and only one organizational unit corresponding to a specific overhead or indirect cost pool are "distributed" to that pool. Those facilities capital items which do not have a unique causal or beneficial relationship with a specific organizational unit (i.e., "undistributed capital") are allocated to the overhead and General and Administrative (G&A) expense pools using any reasonable basis that approximates the actual absorption of depreciation or amortization of these facilities. As an alternative, all undistributed capital may be assigned to the G&A pool. Thus, the cost of money applicable to these items is distributed in the same manner as the G&A expenses. The total net book value associated with each indirect cost pool is the sum of the distributed and undistributed allocations to that pool.

The cost of money for the accounting period is obtained by multiplying the total net book value as determined above by the applicable cost of money rate for the same period. This rate is defined as the arithmetic mean of the interest rates specified by the Secretary of the Treasury under Public Law 92-41 for the applicable cost accounting period.

In order to facilitate the allocation of the cost of money to specific contracts, a "cost of money factor" is obtained for each indirect cost pool. This factor is the result of dividing the cost of money associated with a cost pool by the appropriate allocation base associated with that pool. This factor represents the cost of money which is allocated to each individual unit of measure of the indirect cost pool allocation base.

The cost of money for each CAS covered contract for a given cost accounting period is the sum of the products of the allocation base units (e.g., direct labor hours) identified with the contract and the cost of money factors for the corresponding overhead or indirect cost pools.

CAS 414 became effective October 1, 1976.

2. Proposed Amendment to Cost Accounting Standard 414

In order to extend coverage to include assets under construction, the proposed amendments to CAS 414 (Appendix B) center on four main areas.

The first area of change require the modification of the respective paragraphs to include assets under construction as part of the facilities capital base. For example, the fundamental requirement paragraph of CAS 414 would be amended to include: "The capital invested in facilities capital items being constructed, fabricated or developed for contractors own use shall be included in the base" [13]. It is important to note that the term "own use" specifies an important requirement for assets under construction to be included under this standard. In order for an asset under construction to be included it must be expected to be used in the normal operation of the business upon its completion.

Costs allocated to facilities capital items being constructed, fabricated, or developed for contractor's own use pursuant to 4 CFR 404 shall be also included provided the

contracting parties anticipate that the asset will be used in the regular operation of the business unit [13].

The second change involves establishment of a criterion for calculating the investment base in assets under construction. Accounting data available in a contractor's accounting system are to be used to establish the contractor's investment in assets under construction for the cost accounting period.

The third change involves the requirement for anticipated use in the business operations to be used in establishing the distribution of the assets to individual business units. If the anticipated use of the asset under construction is uniquely applicable to a single organizational unit corresponding to a specific overhead pool, then the assets under construction will be included with the other distributed assets associated with this pool.

The last change involves treatment of undistributed assets under construction. Undistributed assets shall be assigned to the G&A expense pool in order to be allocated over a total activity base to the various final cost objectives. This differs from treatment of facilities capital in use, where the undistributed assets may be assigned either to the G&A pool or to all the cost pools on a basis that would approximate the absorption of depreciation or amortization of these assets.

#### C. SUMMARY

In response to a perceived need for the allocation to negotiated contracts of an appropriate share of the contractor's total cost of capital associated with facilities capital investments, the Cost Accounting Standards Board issued CAS 414, Cost of Money as an Element of the Cost of Facilities Capital. This standard established the criteria for

the measurement and allocation of the cost of money associated with facilities investments to negotiated defense contracts. There is currently a proposal to extend the idea of cost of money not only to assets in use but also to facilities capital under construction. Two alternatives have been presented by the staff for consideration.

Alternative A would involve the publishing of a separate standard to deal with assets under construction. The cost of money calculated for each accounting period would be capitalized as part of the acquisition cost of the asset. The cost of money rate to be used would be the arithmetic mean of the appropriate rates established by the Secretary of the Treasury under Public Law 92-41. This would be multiplied by the representative investment value of each asset to obtain the cost of money to be capitalized.

The FASB is currently considering a proposal which would require the capitalization of interest costs associated with construction period expenditures. The FASB proposed standard would require the capitalization of the interest expense associated with debt only. The CASB proposed standard, however, would result in the capitalization of an interest cost that would include consideration both of debt and equity. At this writing, the CASB is postponing a decision on its two proposals until such time as the FASB rules on its proposed capitalization standard. This ruling is expected by October 1, 1979.

Alternative B would involve treatment of the cost of money on assets under construction as a period expense of the construction period. This would be accomplished by amending the current CAS 414 to include consideration of facilities capital under construction.

In response to the CASB staff draft proposal, members of the public accounting profession, academe, government and industry supplied comments regarding the alternatives for treatment of cost of money on assets under construction. An examination of these responses is the subject of the next section.

IV. REVIEW OF COMMENTS ON CASB  
STAFF DRAFT PROPOSALS

In a letter dated May 5, 1978, Paul McClenon of the CASB staff issued a letter requesting comments on two staff draft proposals for dealing with the cost of money with regards to assets under construction [13]. The alternatives for consideration were presented in the preceding section. A total of sixty-five members of industry, government, public accounting, and the academic profession sent responses to this request. Of this total only fifty-nine were usable. This included thirty-nine responses from industry, eleven from government agencies, six from members of the public accounting profession, and three responses from academe. This section will summarize the comments received by the CASB staff.

In order to summarize the responses, comments have been grouped into the following areas:

- A. The desirability of the coverage being considered.
- B. Which approach is preferable.
- C. The effect on contract pricing.
- D. Implementation issues and the costs associated with implementation.

Each area will be further examined on the basis of how respondents in each class (i.e. industry, government, public accounting, and academe) viewed the question. This should enable comparison and/or contrast between the different classes of commentators.

**A. THE DESIRABILITY OF THE COVERAGE BEING CONSIDERED**

Commentators largely supported the desirability of the concept of recognizing the cost of money on assets under construction. An adjusted percentage of 85.2% of the commentators responding in this area favored the concept.

### 1. Industry Response

Industry representatives overwhelmingly supported the desirability of the coverage. Of the industry respondents, thirty-five or 94.6% felt the extension of cost of money to assets under construction was desirable. The remaining two commentators from industry did not comment on this area. One industry commentator stated:

We believe that current DoD interpretation and guidance discriminates against a contractor who finances his own long term construction work in that it favors those contractors who rely upon others for their financing. This results not only in inequality but also a lack of uniformity and consistency.

This was typical of many comments regarding the lack of recognition in current costing procedures for contractors' self-construction. Another respondent said:

By including the cost of money on assets not in service, the totality of a contractor's investment in facilities capital would be fully recognized.

The cost of money was viewed as being as much a cost in facilities under construction or not yet in service as the cost of money related to completed facilities or those facilities acquired by purchase or lease agreements.

### 2. Government Comments

While industry commentators strongly supported the desirability of the coverage, governmental response was mixed. Of the twelve usable responses from governmental agencies, six (50%) stated the coverage was desirable while six said they did not favor the coverage. Those governmental agencies that saw the coverage as desirable tended to base their views on the perceived link between the cost of money on assets under construction and the cost of money already recognized under CAS 414. One commentator who favored the coverage stated:

... since the CASB saw fit to issue CAS 414... it would seem logical to expand the concept to cost of facilities capital under construction.

Commentators in this class who did not view the coverage as desirable generally felt the extension of the cost of money to assets under construction would lead to greater costs with little or no additional benefit to the government.

### 3. Academic and Public Accounting Comments

The respondents from academe and the public accounting profession generally supported the industry comments. Of the usable comments from academe 66% viewed the coverage as being desirable, while 83% of the respondents from public accounting favored extension of the coverage.

Comments favoring the coverage were generally based on theoretical grounds with emphasis on the "economic reality" of the issue and its logical extension from CAS 414. The imputed nature of the cost was cited by one commentator as a reason for not favoring the coverage. He stated: "I am opposed to entering in the accounting records a fictitious amount. It is too capricious."

## B. WHICH APPROACH IS PREFERABLE

Of the usable replies to the staff letter, only two, or 3.4%, failed to state a preference for either of the alternatives. The large majority of those who had a preference favored Alternative B (73.7%). The remainder favored Alternative A.

### 1. Industry Comments

Industry preference strongly leaned toward Alternative B, with thirty-four commentators (94.5%) favoring this alternative. This preference tended to be based on three reasons. The first centered on the matching of costs charged to contracts with the period of use of the capital.

A typical comment was:

In our view, this alternative (Alternative B) is compatible with the theory that interest, whether actual or imputed, is the amount paid for use of funds for a period of time and therefore should be charged to contracts during the period that the funds are utilized.

The second reason for preference of Alternative B centered on its perceived logical flow from the current CAS 414 and its treatment of the cost of money. Funds invested in facilities capital under construction were viewed as not being substantively different from funds already invested in completed facilities capital items and, therefore, should warrant similar treatment. Also, it was viewed that amendment of CAS 414 would prove easier administratively since the implementation problems associated with the current standard had been resolved.

The last area of support for Alternative B was based on its lack of a requirement for additional record keeping by the contractors. One commentator replied:

On the average, there are 50-100 capital projects in process at our segments, and 'Alternative A' would require another ledger for each project in order to track the capital asset costs including cost of money. The benefits of this alternative are greatly outweighed by the amount of additional effort we anticipate if it were adopted.

The preference by a minority of industry respondents for capitalization of the cost of money centered on the theoretical application of the "matching principle."

The matching principle holds that all of the expenses incurred in generating revenue should be identified, or matched, with the revenue generated, period by period [23;p.14].

Under this theory, the cost of money associated with construction in progress would be treated in the same manner as other costs of construction. This would require that the cost of money be capitalized as part of the value of the asset and then matched through the process of depreciation with the revenues of the periods when the asset is in use.

## 2. Government, Academe, and Accounting Profession

While industry tended to favor Alternative B government, public accounting, and academic representatives favored the capitalization of the cost of money. Alternative A was favored by 80% of the government respondents, 66% of those from academe, and 66% of those from the public accounting profession.

Government preference for Alternative A centered on the matching of the costs associated with construction of an asset with the future contracts which benefit from the asset when it is put into use. One government comment stated:

Those contracts or cost objectives in process during the construction period should not bear the cost of construction or the cost of capital used in construction since they would not normally benefit from those assets then under construction. Those contracts to be performed in some future period will benefit and should bear the cost...

The preference for Alternative A on the basis of the application of the matching principle was also the most widely used reason among representatives of academe and the public accounting profession.

Those representatives of government, accounting, and academe which supported the treatment of the cost of money as a period expense under Alternative B tended to base their preference on the assumption that the implementation of the alternative would prove less complicated

and require fewer additional records on the part of the contractor. This would be due in large part to the already existing procedures applicable to CAS 414.

#### C. THE EFFECT ON CONTRACT PRICING

Only seven of the responses to the staff letter made a reference to either alternatives impact on contract pricing. One reply specifically directed its comments to the "cost of money on top of cost of money" which would result in significant recoveries in excess of the initial investment under the capitalization approach of Alternative A. Other replies tended to center on the overcharging of current contracts under Alternative B with a cost of money which should be associated with future periods. A government reply centered on the necessity to avoid an "inflationary impact" by reducing contractor profits to an extent equivalent to the additional interest cost recognized. This same agency also pointed out the pricing problem which would be associated with its lack of a profit factor in cost-no fee and cost sharing contracts, where overall costs of a contract would increase because of the lack of a profit offset availability.

No respondent stated there would be a favorable impact on contract prices from the adoption of either alternative. It is important to note, however, that there is an obvious industry advantage associated with the adoption of Alternative B. Adoption of this alternative would result in the contractor being able to charge the interest costs to current contracts and, therefore, receive an earlier recovery than through Alternative A.

D. IMPLEMENTATION ISSUES AND THE COSTS ASSOCIATED WITH IMPLEMENTATION

The bulk of implementation issues were proposed in industry replies.

Almost unanimously, all who commented saw no additional or, at the very most, minimal problems linked with implementation of Alternative B.

Alternative A received continued criticism based on the need for additional records for each asset.

Additional record keeping after individual asset capitalization would also be required under Alternative A... since generally accepted accounting principles do not permit the capitalization of imputed interest for financial statement purposes except in the case of regulated public utilities.

(Adoption of the FASB Exposure Draft on accounting for the cost of interest would modify generally accepted accounting principles to include the capitalization of interest on debt capital).

Several contractors recommended changes in the wording of the alternatives in order to include assets under the standards which are acquired from outside vendors or from intra-company sources and are completed but still not in use.

Another industry reply suggested that the contractor be allowed to choose when the new coverage was to be effective. This was seen as a method of minimizing administrative problems associated with the change by allowing contractors to choose an effective date between October 1, 1976 and the beginning of the next fiscal year so as to create the fewest administrative problems.

Government responses regarding implementation issues centered on the inclusion of "development" as distinguished from construction, with reference to assets to be covered under Alternative A.

We believe that the extension of the cost of money to the development of assets will significantly complicate the implementation of this standard. What constitutes an appropriate time period for development of an asset or the allocability of cost of money on unsuccessful development projects are just some of the difficult issues that must be resolved because of this expansion.

The question of implementation costs and their duration was commented on only 32% of the replies. Those individuals or agencies that did comment concurred that the cost for implementation of Alternative B would be minimal. One reply stated:

The impact of 'Alternative B' on costs would be zero since we had done it in the past and no additional work is required. 'Alternative A' would cause some extra work but not any excessive amount of additional cost [13].

There was generally no consensus regarding the implementation costs of Alternative A, although all agreed it would be more than those for Alternative B. Estimates ranged from "minimum" for one reply to a maximum of "a computer program at a cost of approximately \$15,000 plus an ongoing administration cost of \$3000." There was also no consensus as to the timing of the costs to be incurred under each Alternative. Some replies stated the costs would be of a continuous nature, while others said they would be sporadic or strictly one-time.

#### E. SUMMARY

Responses were received to the CASB staff proposals from representatives of industry, government, academe, and the accounting profession. Generally, these comments indicated that the extension of the cost of money concept to include assets under construction was a desirable coverage. Industry overwhelmingly supported the treatment of this cost as a period expense under the proposed revision to CAS 414 and presented as

Alternative B. Government and other replies tended to favor a new standard, Alternative A, which would capitalize the cost of money as part of the acquisition cost of the asset. Government replies also suggested that the extension of this concept would generally result in increased contract prices.

In general, Alternative B was believed to be the simpler and less costly to implement. Alternative A received criticism on the basis of increased administrative requirements and, in some cases, substantial implementation cost differences when compared to current practices or to Alternative B.

## V. ANALYSIS OF ALTERNATIVES

The previous section reviewed the comments received by the CASB staff in response to its staff draft proposals for allocation of the cost of money on assets under construction to defense contracts. This section will examine the impact on DoD contract costs as a result of implementation of these proposals.

### A. ASSUMPTIONS

In order for the analysis and comparison to be performed, certain assumptions were made regarding the two alternatives:

#### 1. Cost Accounting Period

The cost accounting period of the defense contractors in the examples that follow is assumed to be concurrent with the calendar year. Although not directly affecting the outcome of the analysis, this facilitates dealing with the semi-annual interest rates which are determined on a calendar year basis.

#### 2. Depreciation

Where applicable, assets are assumed to be depreciated over a twenty-year time period by the straight-line method for defense contracting purposes.

#### 3. Cost of Money Rate

The interest rates used for the calculations of the cost of money applicable to the period of construction will be the rates stipulated in the illustration in Alternative A. The interest rate used for calculations in future periods will be the rate in effect for the period 1 January to 30 June 1979, 10.25%.

4. Asset Utilization

For simplicity it is assumed that the hypothetical asset will be utilized only on CAS covered contracts and is placed in use immediately upon completion of construction.

5. Cash Flows

To permit the use of standard discounting tables, it is assumed that all cash-flows occur at the end of their respective periods.

6. Implementation Costs

The costs associated with implementation of the alternative proposals were considered by most respondents to the CASB proposals to be minimal. Alternative A was viewed as being more expensive, but no clear consensus was obtained as to what either alternative would cost in the period over which these costs would be incurred. Therefore, for the purpose of this analysis the cost of implementation for both alternatives is considered to be immaterial.

7. DoD Cost Policy

It is assumed that, following implementation of either alternative, DoD policy regarding allowability of costs will be modified to make the cost realized under the applicable allocation alternative a allowable contract cost.

B. THE CONSTRUCTION-IN-PROGRESS ACCOUNT OF DEFENSE CONTRACTORS

In order to analyze the effects on defense contracts of the extension of the cost of money concept to assets under construction, it is first necessary to examine the nature of the construction-in-progress accounts of defense contractors. In order to accomplish this, a list of twenty-five defense contractors who had more than \$10 million in government contracts for 1978 was assembled from the Federal Register. Corporate

10K reports were then obtained in order to ascertain the commitments of these contractors to construction. Data were collected, when available, on the construction-in-progress account's beginning and ending balances as well as net plant, property, and equipment account balances for the years 1976, 1977, and 1978. The Moody's Industrial Manual, 1978 edition, was also consulted to provide additional information to supplement the 10K's where required [15]. A list of the defense contractors for which data were obtained for one or more of the subject years is contained in Appendix C. Eighteen contractors out of the original sample of twenty-five were usable.

The commitment of contractors to construction will be analyzed by first determining the average investment in construction in terms of actual dollar amounts in the sample. This will be followed by the determination of the amount of interest cost that would have been associated with these levels of investment at the interest rates under PL 92-41 that were effective during the three-year period. The commitment to construction will further be evaluated by determining the investment in construction as it related to the net plant, property and equipment account.

#### 1. Average Construction-In-Process Account

The average balances in the respective construction-in-process (CIP) account can be used as one aid to measure the effect on government and defense contracts of adoption of the two alternatives. The data presented in Table 2 were obtained by taking the average of yearly beginning and ending CIP account balances for each contractor, when available, and then deriving statistical data from those observations. The mean value listed for the year is the simple arithmetic average of the values obtained

from average yearly CIP account balances. The standard deviation was obtained using N-1 degrees of freedom where N is the number of observations for the year.<sup>3</sup>

TABLE 2

YEARLY AVERAGE CIP ACCOUNT BALANCE  
FOR 18 DEFENSE CONTRACTORS  
(in thousands)

<u>Year</u>	<u>Min Value</u>	<u>Max Value</u>	<u>Median</u>	<u>Mean</u>	<u>Std. Dev.</u>
1976	\$ 90	\$ 525,650	\$ 9,675	\$ 77,458	\$159,215
1977	127	758,400	95,747	116,462	222,885
1978	1,950	1,084,950	44,369	179,549	369,189

The data indicate that the mean average CIP balance is growing. The percentage changes between the years 1976 to 1977 and 1977 to 1978 are approximately 50% and 54%, respectively. This would indicate substantial real gains in the CIP accounts for the eighteen contractors over the past three years, with the mean average CIP account growing at a compound annual rate of slightly over 52%.

2. Interest and Average CIP

If the cost of money on assets under construction was allocable during the periods discussed above, what would have been the interest cost associated with the level of construction investment? The amount

<sup>3</sup> The formulas used for the computation of the mean ( $\bar{X}$ ) and the standard deviation (S) are given as follows:

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n} \quad S = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n-1}}$$

where:  $X_i$  is the individual contractor average CIP balance for each year  
n is the number of observations for each year [16;p.214].

of interest associated with the average CIP account balances for the subject years is presented in Table 3. The maximum interest cost associated with an individual contractor investment occurred in 1978 with a total of almost \$94 million. The mean interest also rose during the three year period. This coincides with the rise in mean CIP investment over the subject years.

TABLE 3

CIP INTEREST COST  
(in thousands)

<u>Year</u>	Min <u>Value</u>	Max <u>Value</u>	Median	Mean	Std. Dev.	Avg. Int. Rate
1976	\$ 8	\$45,363	\$1,046	\$ 7,351	\$14,295	8.63%
1977	10	59,231	1,230	9,096	17,407	7.81%
1978	168	93,631	3,829	15,495	31,861	8.63%

Table 4 shows an analysis of the ratio of the respective interest costs to the net sales values of the contractors sampled. This ratio represents the amount of interest that a customer could expect to have paid per dollar of sales if the interest were an allowable cost of the period. The maximum ratio occurred in 1977, when a customer could have expected to pay an additional one percent for interest on construction. The largest mean ratio also occurred in 1977, when a two-tenths of one percent increase could have been expected on the average.

TABLE 4

CIP INTEREST TO SALES RATIO

<u>Year</u>	Min <u>Value</u>	Max <u>Value</u>	Median	Mean	Std. Dev.
1976	*.0	.00317	.00072	.00106	.00102
1977	*.0	.01098	.00081	.00191	.00301
1978	.00047	.00206	.00136	.00123	.00052

\* .000004

3. Construction-In-Process Relative to Net Plant Property and Equipment

The preceding analysis indicated substantial increases in contractor construction over the period 1976-1978. The magnitude of this investment in relation to contractor investment in facilities was also examined. This was determined by comparison of the average annual CIP account balance with the average annual contractor investment in fixed assets recorded in the net plant, property and equipment account (NPPE).

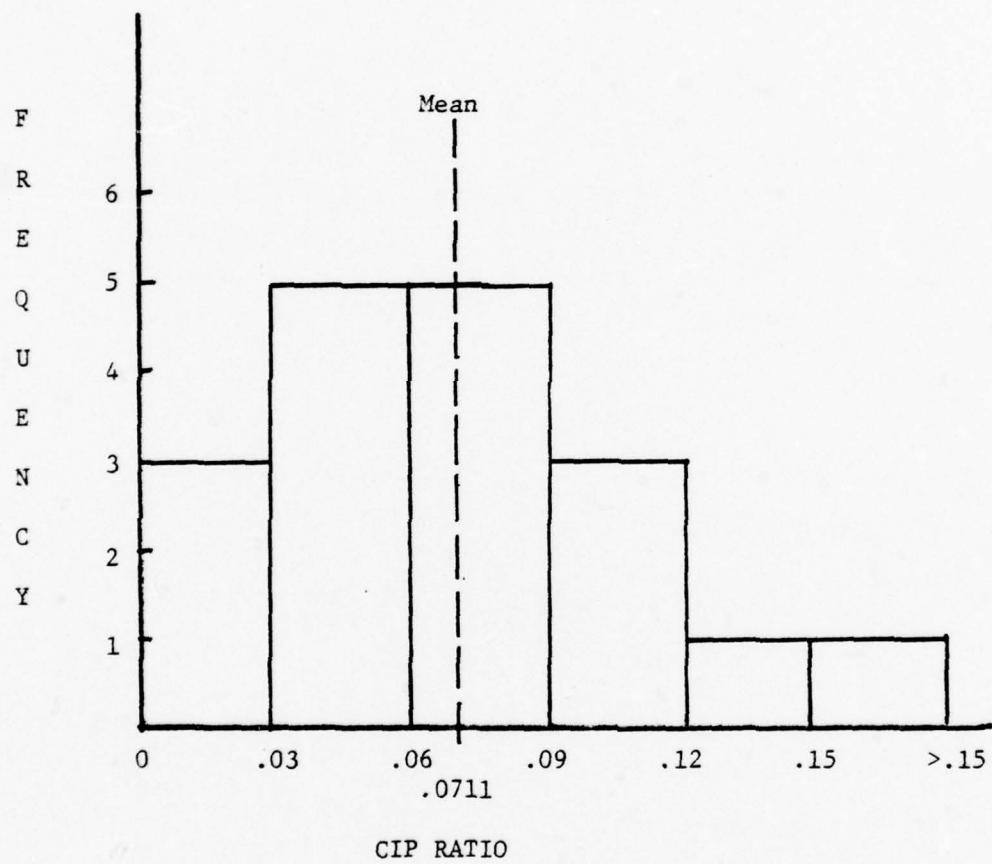
The resulting ratios were then analyzed with the following results:

Mean CIP ratio ( $\bar{X}$ )	7.11% of NPPE
S.D. (S)	4.52%
Median Value	6.09%
Minimum Value	.01%
Maximum Value	19.75%

These data are presented graphically in Figure 1. Although the data are skewed to the right, only four data elements fall outside a one standard deviation confidence interval, with two above and two below the interval. Approximately 78% of the data elements are contained within the confidence interval.

There are wide disparities among individual contractor's investments in construction. The general movement shows increasing dollar commitments on the parts of contractors to construction. This dollar commitment, however, does not necessarily indicate increasing percentages of the NPPE account. While approximately 40% of the contractors sampled are spending larger percentages of their fixed asset amount on construction, an almost equal number showed decreasing percentages over the time period in question. The average NPPE account increased over the same period in 91% of the contractors sampled.

**Figure 1**



### C. PROPOSALS' IMPACTS ON AN INDIVIDUAL ASSET

In this section the impacts of the two proposals on the cost passed on to the government relative to an individual asset will be examined. In current defense contracting, contract costs from individual assets are realized through the media of depreciation and the cost of money calculations provided for under CAS 414. With the implementation of either Alternative A or Alternative B, one or both of these costs will be affected. This analysis will examine the changes that would occur in the implementation of each alternative.

Since individual asset account balances were not available in the research material used, the account balances of the illustration from the proposed Alternative A (of Appendix B) will be used to evaluate and compare the two alternatives' impacts on costs to the government from an individual constructed asset. Table 5 presents the end-of-month account balances for the construction of an individual facilities capital item.

#### 1. Alternative A, Capitalization

Under Alternative A as proposed by the CASB staff, the cost of money would be capitalized in the asset account. This additional amount would then be passed on to the government through the medium of depreciation. Since it affects asset valuation, Alternative A would also result in additional costs to the government through the application of CAS 414 over the life of the asset. As presented in the proposal the applicable cost of money rates for the period of construction are as follows:

1976 January 1 to 30 June	8.75%
July 1 to 31 December	8.50%
1977 January 1 to 30 June	7.75%

This results in a cost of money rate for use in calculations of 7.16% for the period March to December 1976 and 1.94% for January to March 1977.

TABLE 5

END-OF-MONTH BALANCES FOR AN  
ASSET UNDER CONSTRUCTION ACCOUNT

<u>Year</u>	<u>Month</u>	<u>Balance</u>	
1976	March	\$ 25,000	
	April	50,000	
	May	75,000	
	June	100,000	
	July	150,000	
	August	200,000	
	September	250,000	
	October	350,000	
	November	500,000	
	December	750,000	
	1977	January	850,000
		February	1,300,000
March		1,500,000	

These rates are applied to the average month-end balances for 1976 and 1977 and result in costs of money to be capitalized of \$17,542 in 1976 and \$23,944 in 1977. This is presented in Table 6. For additional information on the individual calculations see Appendix 2, Alternative A.

TABLE 6

ALTERNATIVE A  
COST OF MONEY CALCULATIONS

<u>Year</u>	<u>Average EOM Balance (X)</u>	<u>Cost of Money Rate (=)</u>	<u>Cost of Money</u>
1976	\$ 245,000	7.16%	\$ 17,542
1977	1,234,209	1.94%	23,944
TOTAL			\$ 41,486

The cost of money, \$41,486, increases the final asset valuation to \$1,541,486 instead of the original \$1.5 million. Given the assumptions made at the beginning of this section, the \$41,486 represents the additional amount of capitalized cost to be passed on to the government by the adoption of Alternative A. This will be accomplished through the depreciation of this amount over the assumed 20 year life of the asset. However, there will also be additional costs realized due to the effect of CAS 414 on the balance of this additional value over the life of the asset.

Under CAS 414 the average outstanding balance of the asset for each year is multiplied by the prevailing COM rate to arrive at an allowable cost for contract purposes. Table 7 shows the twenty-year depreciation schedule for the additional capitalized cost under Alternative A and the effect of CAS 414 on this additional amount. The cost of

money rate used in this calculation was the current rate in effect for 1 January to 30 June 1979, 10.25%. All amounts have been rounded to the nearest dollar.

It can be seen that, over the twenty-year life of the asset in question, a total of \$84,015 in costs will be recovered through depreciation and CAS 414 on the additional capitalized cost computed under Alternative A if the asset is used only for government contracting. This results because of a compounding of interest on the interest previously capitalized.

## 2. Alternative B, Period Expense

Under Alternative B, the cost of money associated with an asset under construction would be treated as expenses of the various periods of construction rather than capitalized as part of the asset value. Since the asset valuation would remain unchanged, there would be no additional costs recovered through depreciation and no additional effect of CAS 414 during the life of the asset.

Using the same asset account as earlier, the adoption of Alternative B would result in additional COM costs during 1976 and 1977 of \$17,542 and \$23,603 respectively. These amounts differ from those under Alternative A because of the treatment of the costs under the two proposals. Under Alternative A the cost of money for 1976, when capitalized, would become part of the base for calculation of the 1977 interest cost. This is not the case under Alternative B, where the costs are independent. Table 8 shows the calculation of the cost of money applicable under Alternative B.

TABLE 7

COM CAPITALIZED RECOVERY @ 10.25%

<u>Year</u>	<u>Begin Balance</u>	<u>Dep</u>	<u>End Bal</u>	<u>COM</u>	<u>Total</u>
1	\$41,486	\$2,074	\$39,412	\$4,146	\$6,220
2	39,412	2,074	37,338	3,933	6,007
3	37,338	"	35,264	3,721	5,795
4	35,264	"	33,190	3,508	5,582
5	33,190	"	31,116	3,296	5,370
6	31,116	"	29,042	3,083	5,157
7	29,042	"	26,968	2,871	4,945
8	26,968	"	24,894	2,658	4,732
9	24,894	"	22,820	2,445	4,519
10	22,820	"	20,746	2,233	4,307
11	20,746	"	18,672	2,020	4,094
12	18,672	"	16,598	1,808	3,882
13	16,598	"	14,524	1,595	3,669
14	14,524	"	12,450	1,382	3,456
15	12,450	"	10,376	1,170	3,244
16	10,376	"	8,302	957	3,031
17	8,302	"	6,228	745	2,819
18	6,228	"	4,154	532	2,606
19	4,154	"	2,080	319	2,393
20	2,080	<u>2,080</u>	0	<u>107</u>	<u>2,187</u>
			\$41,486	\$42,529	\$84,015

TABLE 8

ALTERNATIVE B  
COST OF MONEY CALCULATION

<u>Year</u>	<u>Avg EOM Balance</u>	<u>Interest Rate</u>	<u>COM</u>
1976	\$ 245,000	7.17%	\$17,542
1977	\$1,216,667	1.94%	23,603
Total			\$41,145

The cost of money applicable to each year would be charged to contracts of that period through the application of CAS 414 procedures.

3. Comparison of the Proposals

The application of the two proposals on a given asset results in costs which are vastly different in amounts and times of occurrence. Capitalization of the COM results in a set of costs which are more than twice as great as treatment of COM as a period expense. These costs, however, are spread over a twenty-year period, compared to just a two-year period under Alternative B. The first costs incurred by the government under capitalization are also two years later than first occurrence under Alternative B, since the government would bear no costs under A until the asset is placed in use.

Given this difference in the amounts and time horizons of the costs associated with the two alternatives, meaningful comparisons of the two must rest on the formulation of an equal base. In order to achieve this comparison, the concept of present value was applied to the cash flows associated with the two alternatives. The base year was defined as the year in which the first costs would be realized by the government. In the example, this would occur at the end of 1976.

Computing the present value of the two alternatives by various discount rates resulted in the following:

	<u>9%</u>	<u>10%</u>	<u>12%</u>
(1) PV Alternative A	\$36,732	\$34,026	\$28,866
(2) PV Alternative B	<u>\$35,959</u>	<u>35,454</u>	<u>34,478</u>
(3) Difference	\$ 773	(\$1,428)	(\$5,612)

The above data indicate two important considerations. First, Alternative A is much more sensitive to a change in the discount rate used in the comparison of the alternatives. Because of the timing of the costs associated with these alternatives, the use of discount rates above approximately 9.3% favor Alternative A, while lower discount rates favor Alternative B. Second, at discount rates of approximately 9 to 10% the difference in present values of the additional costs between the alternatives is minimal and could be considered immaterial. These rates are generally in line with the Secretary of the Treasury rates over the past three years.

## VI. SUMMARY AND RECOMMENDATION

### A. SUMMARY

The primary objective of this research is the determination of the effects on government contract prices resulting from the adoption of either of the alternatives proposed by the CASB for allocation of the cost of money on assets under construction. In order to accomplish this evaluation the actual magnitude of interest on construction in progress in a sample of defense contracting firms was observed. Then the effects of both proposals in the CASB staff draft were determined for a hypothetical asset under construction.

#### 1. Contractor Construction

A sample of eighteen defense contractors was used to ascertain the average level of commitment of these defense contractors to construction. It was determined from the data that the mean dollar value committed by the contractors to construction-in-progress had risen at an annual rate of approximately 52 percent over the period from 1976 to 1978, inclusive. While the average investment in construction was rising in dollar value, however, the percentage of the net plant, property and equipment account that this investment represented followed no set pattern. It was determined that, on the average over the years for which data were available, the percentage of net plant, property, and equipment committed to construction in the sample contractors was slightly over 7 percent.

The interest cost that would have been allocated based on the investment in construction was also calculated. As could be expected, this cost rose with the increased dollar amount of construction. The

mean value of this cost reached a maximum of about one-tenth of one percent of sales in 1977 and the maximum interest expense did not exceed 1.10 percent of sales. This would indicate that, given the highest ratio and with no effects of cost offsets on profits, the government could have expected a 1.1% increase in costs from the contractors sampled based on sales.

## 2. Proposals' Impact on an Individual Asset

Both alternatives proposed by the CASB were evaluated with respect to the cost streams associated with an individual asset. For the construction example given in the text of Alternative A, each alternative generated a vastly different cost stream both in terms of total dollar amount and in the timing of the costs. Capitalization of the cost of money leads to the recovery of over twice the dollar amount associated with treating the cost of money as a period expense. However, due to the timing of the cash flows associated with the life of the asset under capitalization, the present values of the two alternatives are approximately equal at discount rates in the 9 to 10 percent range. The point of indifference occurs at approximately 9.3%.

## B. RECOMMENDATIONS FOR FURTHER RESEARCH

The data provided offer information which could aid in the analysis and modification of DoD cost and/or profit policies regarding the alternatives proposed for the allocation of the cost of money presented here. Additional research might consider the proposals' effects on contractor investment policy and the relationship between this investment policy and modifications to DoD profit policy. The results of such additional research could lead to the refinement of DoD policy for utilization as a more effective means of motivating contractor investment and performance.

APPENDIX A

CASB STAFF LETTER

May 5, 1978

Dear Sir:

You have expressed a willingness to participate in the continuing staff research program of the Cost Accounting Standards Board. The proposals advanced in this letter and its attachments reflect staff research preliminary to Board approval. This letter seeks your comments on the cost of money as an element of the cost of facilities capital as related to assets not yet in service. The subject is similar to one which is currently under consideration by the Financial Accounting Standards Board.

The CASB is considering the merits of extending the concept of "facilities capital" in order to recognize the cost related to contractor investments in assets under construction. Two approaches are being considered for assigning such costs. The first approach is to capitalize the cost of money related to such investment as an element of the acquisition cost of constructed assets. The attached "Alternative A" is a proposal to promulgate a Cost Accounting Standard in order to implement this approach.

The other approach is to allocate the proposed additional cost of money among the cost objectives of the current period. The attached "Alternative B" is a proposal to amend CAS 414 in order to implement this approach. (In this alternative, the proposed changes are underlined.)

We would appreciate your comments on:

1. The desirability of the coverage being considered.
2. Which approach is preferable and the reasons for your preference.
3. Any other implementation issues.
4. The wording of the proposed regulations.

We would also find it helpful if you would provide data on the costs of assets under construction or development at the end of each month for the past 3 years for any business unit that has a significant amount of CAS-covered contracts. In addition, you are also urged to submit data regarding any impact on the administrative costs of your company that might result from this Standard and to comment on whether any such impact would be one-time or continuing. Such data together with other comments will assist the Board in evaluating the proposed costs of implementation of the Standards, including inflationary effects if any, and the probable benefits including advantages and improvements in the pricing, the administration, and the settlement of contracts.

We would appreciate receiving your comments on this material by August 7, 1978. Please indicate the name and telephone number of the person in your organization we may call for supplemental discussion about your comments, if other than yourself. Please call me at (202) 275-5537 or Rein Abel at (202) 275-5514 if you would like to discuss any aspect of this proposal.

Sincerely,

Paul McClenon  
Project Director

## APPENDIX B

### Alternative A

#### Part 4 Cost of Money as an Element of the Cost of Facilities Capital Under Construction or Development

THIS DRAFT STANDARD HAS NOT BEEN APPROVED BY THE COST ACCOUNTING STANDARDS BOARD. IT REPRESENTS STAFF RESEARCH IN THIS SUBJECT AREA.

##### §4 .10 General applicability.

General applicability of this Cost Accounting Standard is established by §331.30 of the Board's regulations on applicability, exemption, and waiver of the requirement to include the Cost Accounting Standards contract clause in negotiated defense prime contracts and subcontracts (4 CFR 331.30).

##### §4 .20 Purpose.

The purpose of this Cost Accounting Standard is to establish criteria for the measurement and allocation of the cost of money attributable to facilities under construction or development as an element of the cost of those assets. Consistent application of these criteria will improve cost measurement by providing for recognition of cost of contractor investment in assets under construction.

##### §4 .30 Definitions

- (a) The following are definitions of terms prominent in this Standard:
  - (1) Facilities Capital. The net book value of tangible capital assets and of those intangible capital assets that are subject to amortization.

(2) Intangible Capital Asset. An asset that has no physical substance, has more than minimal value, and is expected to be held by an enterprise for continued use or possession beyond the current accounting period for the benefits it yields.

(3) Tangible Capital Asset. An asset that has physical substance, more than minimal value, and is expected to be held by an enterprise for continued use or possession beyond the current accounting period for the services it yields.

(b) The following modifications of definitions set forth in Part 400 of this chapter are applicable to this Standard: None.

§4\_.40 Fundamental Requirement.

(a) The cost of money applicable to a contractor's investment in facilities capital items being constructed, fabricated or developed for the contractor's own use shall be included in the capitalized cost of such items.

(b) The investment in facilities capital items referred to in (a) above shall be measured in accordance with the criteria set forth in this Standard. The capitalized cost shall also include applicable amounts identified as a part of the cost of facilities capital items pursuant to 4 CFR 414.

(c) The cost of money rate used shall be based on interest rates determined by the Secretary of the Treasury pursuant to Public Law 92-41 (85 Stat. 97).

§4\_.50 Techniques for Application.

(a) The cost of money to be included as cost of each facilities capital item being constructed, fabricated, or developed for a contractor's own use shall be determined once for each cost accounting period.

(b) Any amount of cost of money allocated to a facilities capital item being constructed, fabricated or developed in accordance with consistent application of the provisions of 4 CFR 414 shall be included in the cost of the asset at the end of the cost accounting period, or at the time the asset is ready for use in a normal or acceptable fashion. In the application of paragraphs §4 .50(c) and (e) below this amount shall not be included in the average investment for the same time period but shall be taken into account in determining the investment of the next relevant time period.

(c) For each facilities capital item a representative investment value shall be determined for each cost accounting period or any fraction thereof. This value will normally be the arithmetic mean of the recorded month-end balances during the period under consideration. Where 4-week or 5-week periods are regularly used in the contractor's cost accounting system, the balances at the ends of such periods should be used instead of month-end balances. Where substantially the same results can be obtained by using balances at the beginning and at the end of the annual period or any part thereof, such a procedure may be substituted for the computation based on month-end balances.

(d) One cost of money rate shall be used for each cost accounting period or any fraction thereof. The rate shall be the arithmetic mean of rates in effect for the monthly periods included in the cost accounting period. Where the relevant time period is a fraction of the year the rate shall be a corresponding fraction of the annual rate. The rate so determined shall be applied to the representative investment value for each facilities capital item established in accordance with the provisions of §4 .50(c) above.

(e) As an alternative to the procedure outlined in (c) and (d) the contractor may consistently compute the amount of cost of money for each facilities capital item by applying individually the appropriate fraction of the prevailing monthly cost of money rate to the relevant recorded month-end balance.

§4\_.60 Illustration.

A contractor has decided to act as his own general contractor in building a major addition to his plant using both his own labor and outside subcontractors. It took some 13 months to complete the building at which time it became ready for use in a normal or acceptable fashion. The total cost of the addition, exclusive of any cost of money turned out to be \$1.5 million. The rate at which this cost was incurred is reflected in the following end of month cumulative balances:

1976	March	\$ 25,000
	April	50,000
	May	75,000
	June	100,000
	July	150,000
	August	200,000
	September	250,000
	October	350,000
	November	500,000
	December	750,000
1977	January	850,000
	February	1,300,000
	March	1,500,000

The above amounts include 1976 cost of money computed with reference to existing production facilities and allocated to this construction project (on a direct labor base) pursuant to CAS 414. However, in accordance

with §4.50(b), any cost of money allocated to this project during 1976 can be capitalized only at the beginning of 1977. Therefore, the January 1977 figures include the entire CAS 414 charge for 1976.

Furthermore, it should be noted that these figures do not include any CAS 414 cost of money for the three months of 1977. Again, pursuant to §4.50(b), this amount can be added to the recorded asset balance only after the computations shown in this illustration have been completed.

Cost of money rates for the relevant time period were--

1976	January 1 through June 30	8-3/4%
	July 1 through December 31	8-1/2%
1977	January 1 through June 30	7-3/4%

The contractor's cost accounting period coincides with the calendar year.

In accordance with the provisions of §4.50(a) the cost of money computed with reference to this self-constructed building must be determined and included in the cost at the end of 1976 and at the time when the building becomes ready for use in a normal or acceptable fashion.

Major fluctuations have taken place in the recorded net book value of the building as the work progressed. Therefore, end of the month balances are used for computing the average balances outstanding for capitalization purposes in accordance with §4.50(c).

The two computations for capitalization purposes will be performed as follows:

December 31, 1976

End of month balances in the construction-in-progress account

March	\$ 25,000
April	50,000
May	75,000
June	100,000

End of month balances in the construction- in-progress account (Cont'd)	July	150,000
	August	200,000
	September	250,000
	October	350,000
	November	500,000
	December	750,000
		<hr/>
		<u>\$ 2,450,000</u>

Average balance outstanding for the ten-month period is--

$$\frac{\$2,450,000}{10} = \underline{\underline{\$245,000}}$$

The annual cost of money rate for the relevant time period is--

$$\frac{(4 \times 8-3/4\%) + (6 \times 8-1/2\%)}{10} = \underline{\underline{8.6\%}}$$

To reduce the annual rate to a rate applicable to the ten-month period an appropriate proportionate fraction is computed in accordance with §4.50(d) as follows:

$$\frac{10 \text{ months}}{12 \text{ months}} = .833$$

Therefore, the amount of cost of money to be capitalized as of December 31 is  $.833 \times 8.6\%$  or 7.16% of \$245,000. This amount, i.e. \$17,542, will be added to the construction-in-progress account, as of December 31, 1976, the balance of which will therefore become--

$$\$750,000 + \$17,542 = \$767,542$$

March 31, 1977

End of month balances on construction-  
in-progress account:

January (as recorded)	\$ 850,000
1976 cost of money	<u>17,542</u>

March 31, 1977

End of month balances on  
construction-in-progress  
account (Cont'd)

	\$ 867,542
February	1,317,542
March	<u>1,517,542</u>
	<u>\$3,702,626</u>

Average balance outstanding for the three month  
period is--

$$\frac{\$3,702,626}{3} = \underline{\$1,234,209}$$

The annual cost of money rate for the relevant time period is 7-3/4%.

To reduce the annual rate for a rate applicable to the three-month period the appropriate fraction is computed as follows:

$$\frac{3 \text{ months}}{12 \text{ months}} = .25$$

Therefore, the amount of cost of money to be capitalized as of March 31 is  $.25 \times 7\frac{3}{4}\%$  or 1.94% of \$1,234,209. This amount, i.e. \$23,944, will be added at this time to the construction-in-progress account the balance of which will therefore become  $\$1,517,542 + \$23,944 = \$1,541,486$ . Since the building became ready for use at the end of month, this amount together with any cost of money allocation for the three months pursuant to CAS 414 will be capitalized as its acquisition cost.

§4\_.70 Exemptions.

None for this Standard.

§4\_.80 Effective date.

- (a) The effective date of this Cost Accounting Standard is [reserved].

(b) This Cost Accounting Standard shall be followed by each contractor for all facilities capital items where construction, fabrication or development by the contractor starts after the effective date.

Alternative B

Proposed Amendments to Part 414

§414.20 Purpose.

The purpose of this Cost Accounting Standard is to establish criteria for the measurement and allocation of the cost of capital committed to facilities as an element of contract cost. Such facilities include those in use and those being constructed, fabricated or developed for contractor's own use. Consistent application of these criteria will improve cost measurement by providing for allocation of cost of contractor investment in facilities capital to negotiated contracts.

§414.40 Fundamental requirement.

(a) A contractor's facilities capital shall be measured and allocated in accordance with the criteria set forth in this Standard. The allocated amount shall be used as a base to which a cost of money rate is applied. The capital invested in facilities capital items being constructed, fabricated or developed for contractor's own use shall be included in the base.

§414.50 Techniques for application.

(a) The investment base used in computing the cost of money for facilities capital in use shall be computed from accounting data used for contract cost purposes. For facilities capital items being constructed, fabricated, or developed for contractor's own use appropriate data recorded in the contractor's accounting system shall be used. The form and instructions stipulated in this Standard shall be used to make the computation.

414 Appendix A - Basis

. . . More specifically, facilities capital values used should be the same values that are used to generate depreciation or amortization that is allowed for Federal Government contract costing purposes; land which is integral to the regular operation of the business unit shall be included. Costs allocated to facilities capital items being constructed, fabricated, or developed for contractor's own use pursuant to 4 CFR 404 shall be also included provided the contracting parties anticipate that the asset will be used in the regular operation of the business unit.

Accumulation and Direct Distribution of Net Book Value (Col. 2)

Recorded, Leased Property, Corporate - The net book value of facilities capital items in this column shall represent the average balances outstanding during the cost accounting period. This applies both to items that are subject to periodic depreciation or amortization and also to such items as land and facilities capital items being constructed, fabricated, or developed for contractor's own use that are not subject to periodic write-offs .... "Recorded" facilities are the facilities capital items owned by the contractor, carried on the books of the business and used or, in case of items being constructed, fabricated or developed for contractor's own use, expected to be used, in its regular business activity.

"Leased property" is the capitalized value of leases for which constructive costs of ownership are allowed in lieu of rental costs under Government procurement regulations. Corporate or group facilities are the business unit's allocable share of corporate-owned and leased facilities. The net book value of items of facilities capital which are held or controlled by the home office shall be allocated to the business unit on a basis consistent with home office expense allocation. Facilities

capital items being constructed, fabricated or developed for contractor's own use shall be allocated to the business unit in accordance with the anticipated use of these items.

Distributed and Undistributed. - All facilities capital items in use and facilities capital items being constructed, fabricated or developed for contractor's own use that are identified in the contractor's records as solely applicable to an organizational unit corresponding to a specific overhead. G&A or other indirect cost pool which is used to allocate indirect costs to final cost objectives, are listed against the applicable pools and are classified as "distributed." "Undistributed" is the remainder of the business unit's facilities capital. The sum of "distributed" and "undistributed" must also correspond to the amount shown on the "total" line.

Allocation of Distributed. - List in the narrative column all the overhead and G&A expense pools to which "distributed" facilities capital items in use and facilities capital items being constructed, fabricated or developed for contractor's own use have been allocated. Enter the corresponding amounts in (Col. 2). The sum of all the amounts shown against specific overhead and G&A expense pools must correspond to the amount shown in the "distributed" line.

Allocation of Undistributed (Col. 3) - Business unit "undistributed" facilities are allocated to overhead and the G&A expense pools on any reasonable basis that approximates the actual absorption of depreciation or amortization of such facilities. For instance, the basis of allocation of undistributed assets in each business unit between, e.g. engineering overhead pool and the manufacturing overhead pool should be related to the manner in which the expenses generated by these assets are allocated

between the two overhead pools. Detailed analysis of this allocation is not required where essentially the same results can be obtained by other means. Where the cost accounting system for purposes of Government contract costing uses more than one "charging rate" for allocating indirect costs accumulated in a single cost pool, one representative base may be substituted for the multiplicity of bases used in the allocation process. The net book value of service center facilities capital items appropriately allocated should be included in this column. Any undistributed item that is being constructed, fabricated or developed for contractor's own use should be allocated to a G&A expense or similar indirect cost pool that uses an allocation base representing the total activity of the business unit. The sum of the entries in Column 3 is equal to the entry in the undistributed line. Column 2.

A supporting work.....

APPENDIX C

GOVERNMENT CONTRACTORS SAMPLED

Aluminum Company of America

AMAX Incorporated

Boeing Company

FMC Corporation

General Motors Corporation

General Tire and Rubber Company

Goodyear Tire and Rubber Company

Harris Corporation

Honeywell

Itek Corporation

International Telephone and Telegraph

Lockheed Corporation

Northrop Corporation

Parker-Hannifir Corporation

RCA Corporation

Thiokol Corporation

Union Carbide Corporation

Whittaker Corporation

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